
Multiple layers of molecular controls modulate self-renewal and neuronal lineage specification of embryonic stem cells.

Journal: Hum Mol Genet

Publication Year: 2008

Authors: Gene W Yeo, Nicole Coufal, Stefan Aigner, Beate Winner, Jonathan A Scolnick, Maria C N Marchetto, Alysson R Muotri, Christian Carson, Fred H Gage

PubMed link: 18632700

Funding Grants: Molecular and Cellular Transitions from ES Cells to Mature Functioning Human Neurons, Training in the Biology of Human Embryonic Stem Cells and Emerging Technologies

Public Summary:

Scientific Abstract:

Elucidating the molecular changes that arise during neural differentiation and fate specification is crucial for building accurate in vitro models of neurodegenerative diseases using human embryonic stem cells (hESCs). Here we review the importance of hESCs and derived progenitors in treating and modeling neurological diseases, and summarize the current efforts for the differentiation of hESCs into neural progenitors and defined neurons. We recapitulate the recent findings and discuss open questions on aspects of molecular control of gene expression by chromatin modification and methylation, posttranscriptional regulation by alternative splicing and the action of microRNAs, and protein modification. An integrative view of the different levels will hopefully provide much needed insight into understanding stem cell biology.

Source URL: <https://www.cirm.ca.gov/about-cirm/publications/multiple-layers-molecular-controls-modulate-self-renewal-and-neuronal>